This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Please amend claims 1 and 35. All pending claims, whether or not amended, are presented below for the Examiner's convenience.

1. (currently amended) A particle analyzing apparatus for analyzing particles in a sample liquid comprising:

an elongated capillary tube having a predetermined internal cross-sectional area, said capillary tube having first and second ends,

a pump connected to the first end of the capillary tube with the second end of the capillary tube being suspended for [emersion] immersion into the sample fluid, said pump serving to draw sample fluid into the second end of the capillary[channel] tube and through the capillary [channel] tube to cause particles in said fluid to flow along said capillary [channel] tube,

a light source for illuminating a predetermined length of the capillary [channel] tube to illuminate the particles in a predetermined volume of sample liquid in said predetermined length to cause illuminated particles to emit fluorescent [and] light, and

at least one detector for detecting the fluorescent light emitted by particles in said volume of samples liquid excited by the illumination impinging upon particles in said [predetermined] volume.

2. (previously cancelled)

3. (previously amended) A particle analyzing apparatus as in claim 1 in which the capillary cross-section is circular.

4. (previously amended) A particle analyzing apparatus as in claim 1 in which the capillary cross-section is rectangular.

5. (previously presented) A particle analyzing apparatus as in claim 2 including an additional detector for detecting all particles flowing along said capillary tube.

6. (previously presented) A particle analyzing apparatus for analyzing a sample as in claim 5 in which said additional detector detects light scattered by particles in said predetermined length.

7. (previously presented) A particle analyzing apparatus as in claim 5 in which said at least one detector detects a change in impedance caused by said flowing particles.

8. (previously presented) A particle analyzing apparatus for analyzing a sample as in claim 1 in which said detector for detecting fluorescent light includes a lens for intercepting fluorescent light, and

a slit located at the focus of the lens for blocking unwanted light from said detector.

9. (currently amended) A particle analyzing apparatus for analyzing a sample as in claim 8 including an additional detector for detecting light scattered by the particles in said predetermined volume.

10. (previously presented) A particle analyzing apparatus for analyzing a sample as in claim 6 or 9 in which said particle detector includes a beam blocker for blocking direct light whereby said detector receives only scattered light.

11. (previously presented) A particle analyzing apparatus for analyzing a sample as in claims 6 or 9 in which the particle detector is an off-axis detector.

12. (previously withdrawn) A particle analyzing apparatus for analyzing a sample comprising:

a capillary tube having a predetermined internal cross-section having one end suspended,

a pump connected to one end of the capillary tube for drawing sample into the tube through the suspended end of the capillary tube,

a source of light,

an optical system for receiving and focusing the light from said source to form and direct a thin rectangular beam through said capillary tube to define an analyzing volume in said capillary tube, said capillary tube selected to have a diameter which causes substantially all particles to be singulated as they pass through said analyzing volume,

at least one detector for detecting those particles in which fluorescence is excited by said beam, and

a detector for detecting all particles which pass through said analyzing volume.

13. (previously withdrawn) A particle analyzing apparatus as in claim 12 including a plurality of detectors for detecting particles which fluoresces at different wavelengths.

14. (previously withdrawn) A particle analyzing apparatus as in claim 12 in which said particle detector detects light scattered by said particles.

15. (previously withdrawn) A particle analyzing apparatus as in claim 12 in which said particle detector detects the electrical impedance of said particles.

16. (previously withdrawn) A particle analyzing apparatus as in claim 12 in which the capillary tube internal cross-section is rectangular.

17. (previously withdrawn) A particle analyzing apparatus as in claim 12 in which the capillary tube internal cross-section is cylindrical.

18. (previously withdrawn) A particle analyzing apparatus as in claim 12 in which the optical system is configured to form a thin, wide rectangular beam at the capillary to illuminate a small analyzing volume defined by the thickness of the beam in the direction of flow of said fluid and by the internal walls of the capillary in the other direction.

19. (previously withdrawn) A particle analyzing apparatus as in claim 14 including a beam blocker for blocking the direct transmission of illumination from said beam to the particle detector.

20. (previously withdrawn) A particle analyzing apparatus comprising:

a capillary tube of predetermined internal cross-section selected such as to singulate particles flowing therethrough,

a tee, a pump connected to one arm of said tee,

a capillary conduit extending from another arm of said tee and connected to one end of the capillary tube,

a discharge conduit and a valve connected to the other arm of said tee, whereby when the valve is closed, the pump can draw fluid from the other end of the capillary through said capillary, and when the valve is opened the pump can discharge fluid sample previously drawn through the capillary,

a light source for illuminating a predetermined analyzing volume of fluid in said capillary tube,

at least one detector for detecting fluorescent light emitted by particles flowing through said volume in response to said illumination, and

a detector for detecting particles which flow through said analyzing volume.

21. (previously withdrawn) A particle analyzing apparatus as in claim 19 in which said at least one detector means for detecting fluorescent light emitted by particles in said volume includes:

means for gathering fluorescent light emitted by particles in said volume,

a beam splitter for receiving said gathered light and reflecting light above a predetermined wavelength and passing light below said predetermined wavelength,

a first detector for receiving the transmitted light and providing a first output signal for particles tagged to emit light below said predetermined wavelength,

a second detector for receiving the reflected light and providing a second output signal for particles tagged to emit light above said predetermined wavelength.

22. (previously withdrawn) A particle analyzing apparatus as in claim 21 in which said predetermined wavelength is 620 nm, said light below said predetermined wavelength is 580 nm, and above said predetermined wavelength is 675 nm.

23. (previously withdrawn) A particle analyzing apparatus as in claim 22 including a filter interposed between the beam splitter and each detector for passing light at 580 nm and 675 nm, respectively.

24. (previously withdrawn) A particle analyzing apparatus as in claim 21 in which said means for gathering the fluorescent light emitted by particles comprises:

a lens for collecting the light, and

a slit positioned in front of said at least one detector to define the analyzing volume observed by said detector.

25. (previously withdrawn) A particle counting apparatus as in claim 20 or 21 in which the diameter of said discharge conduit is substantially larger than the diameter of the capillary tube.

26. (previously withdrawn) Method of detecting particles in a sample fluid which comprises the steps of:

providing a capillary tube of predetermined internal cross-section with a suspended end,

drawing the sample fluid through the suspended end of said capillary tube and through the capillary tube to cause substantial singulation of the particles,

focusing a beam of light onto the capillary tube to illuminate particles in an analyzing volume bounded by the walls in one direction and the beam size in the other direction, and

detecting fluorescent light emitted by tagged particles in response to the illumination of said volume, and providing an output signal.

27. (previously withdrawn) The method of claim 26 including the additional step of detecting light scattered by said particles as they travel through said volume and providing an output signal.

28. (previously withdrawn) The method of claim 26 including the additional step of processing said output signals and identifying the particles and their concentration.

29. (previously withdrawn) A particle analyzing apparatus for analyzing a sample comprising:

an elongated capillary tube having a predetermined internal cross-section,

a pump connected to one end of the capillary tube for drawing sample into the other end of the capillary tube and through the capillary tube to cause particles to flow along said capillary tube,

a light source for illuminating a predetermined analyzing volume of sample in the capillary tube,

means for gathering a fluorescent light emitted by said particles excited by illumination impinging on the particles, and

at least one detector for receiving said gathered fluorescent light.

30. (previously withdrawn) A particle analyzing apparatus as in claim 29 in which said gathering means comprises a fiber optic waveguide for guiding the light into the detector.

31. (previously withdrawn) A particle analyzing apparatus as in claim 20 in which said at least one detector means for detecting fluorescent light emitted by particles in said volume includes a plurality of detectors configured to detect fluorescent light emitted at a plurality of different wavelengths.

32. (previously withdrawn) A particle analyzing apparatus as in claim 31 in which said means for illuminating the predetermined volume illuminates the volume with light of a plurality of different wavelengths.

33. (previously withdrawn) A particle analyzing apparatus as in claim 29 or 30 in which said light source comprises means for projecting a thin rectangular beam through the capillary.

34. (previously presented) A particle analyzing apparatus as in claim 1 in which the predetermined internal cross sectional area of said capillary is such as to cause substantially all particles to singulate as they pass through the illuminated length.

35. (previously presented, currently amended) A particle analyzing apparatus as in claim 1 [including] which includes:

means for gathering fluorescent light emitted by particle in said illuminated length,

a beam splitter for receiving said gathered light and reflecting light above a predetermined wavelength and passing light below said predetermined wavelength, and

in which said at least one detector includes:

a first detector for receiving the transmitted light and providing a first output signal for particles tagged to emit light below said predetermined wavelength, and

a second detector for receiving the reflected light and providing a second output signal for particles tagged to emit light above said predetermined wavelength.

36. (previously presented) A particle analyzing apparatus as in claim 35 in which said predetermined wavelength is 620 nm, said light below said predetermined wavelength is 580 nm, and above said predetermined wavelength is 675 nm.

37. (previously presented) A particle analyzing apparatus as in claim 35 including a filter interposed between the beam splitter and each detector for passing light at 580 nm and 675 nm, respectively.

38. (previously presented) The method of analyzing particles in a liquid sample comprising the steps of:

selecting a capillary having an internal diameter which will singulate particles as the sample flows through the capillary;

immersing one end of the capillary in the liquid sample;

drawing liquid sample through the capillary by pumping from the other end of the capillary;

illuminating a predetermined length of said capillary to define a volume of sample in the capillary; and

detecting fluorescent signals generated by particles flowing through said illuminated volume.